

Summary

The invention relates to processes for the formation of isolation structures for micro-machined sensors in single-crystal surface technology.

In known processes, silicon structures defined by deep trenches are etched and uncovered by a "release etch" step also at their bottom surface towards the substrate. The subsequent lining of these trenches with a non-conducting insulating material, such as silicon dioxide leads to a firm anchoring by means of a surrounding of the silicon structure with the lined trenches on three sides, leaving one side uncovered.

It is the main idea of the invention – instead of lining the trenches – to convert thin-walled silicon into an electrically non-conducting material. This can, for instance, be accomplished by means of a thermal oxidation of narrow silicon ribs released prior thereto by trenches. In the minimal configuration, two trenches (holes) per rib with the required structure depth must be etched for this purpose. The silicon rib between them must be narrow enough to permit its complete thermal through oxidation.